DOCUMENT RESUME

ED 366 298 IR 016 494

TITLE Technology Retreat '88 Proceedings (Tempe, Arizona, May 1988).

INSTITUTION Maricopa County Community Coll. District, Tempe, AZ. Maricopa Center for Learning and Instruction.

PUB DATE May 88

NOTE 37p.; For additional "Ocotillo Reports" 1989-1993, see IR 016 495-499.

PUB TYPE Collected Works - Conference Proceedings (021)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS Access to Information; *Community Colleges; *Computer Assisted Instruction; Computer Centers; Conferences; Discussion Groups; *Educational Technology; *Financial Support; Futures (of Society); Higher Education; Information Networks; Intercollegiate Cooperation; Learning Resources Centers; Learning Theories; *Library Development; *Technological Advancement

IDENTIFIERS *Maricopa County Community College District AZ

ABSTRACT

The Maricopa Community Colleges in Tempe (Arizona) have made strong commitments to the acquisition and utilization of electronic technology, as was emphasized in their 1988 Technology Retreat, a gathering to discuss making the best use of available and future educational technology. The keynote speaker, Stephen C. Ehrmann, presented "Specifications and Strategies: A Sustainable Investment in Technologies." In a small group setting, participants wrote statements about how students learn, technology implementation, and the present organizational structure. In another small group, retreat participants wrote some statements about the future and how use of technology can be enhanced. Other small groups addressed the following topics: (1) alternative funding for technology applications; (2) integration of learning theory, content, and technology; (3) library/learning resource center of the future; (4) designing computer facilities; (5) improving access to learning with technology; (6) where we want to go and how we get there; (7) the classroom of the future; and (8) cross-college collaboration. Two figures illustrate the keynote address. (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 366 298

Technology Retreat '88 Proceedings

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Naomi O. Story

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

Authorities Tolerate Isolated Fires

The ranger explains,
they burn themselves out,
but some can smolder,
hide in hollow logs,
travel the root systems of the evergreens,
outlast snowdrifts. In spring
their heat can reappear.

I've come from the city
to learn the peaks and trees.
In the fourth decade of my life
I write, I make speeches,
some embers survive
sleet, some sparks slip
sideways underground,
some fires endure.

for Florence Luscombe
by Dolores Hayden

Table of Contents

OPENING CEREMONIES

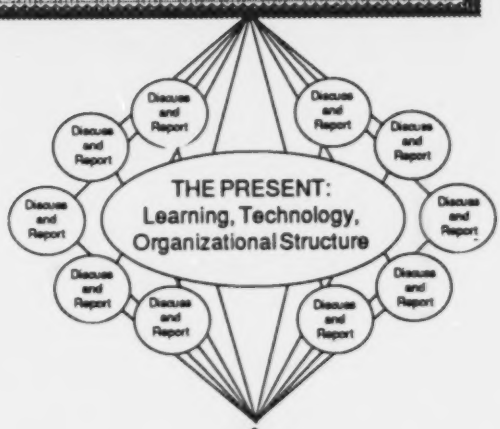
Alfredo G. de los Santos Jr. "Opening Remarks" 1

Alan Jacobs "Welcome" 2

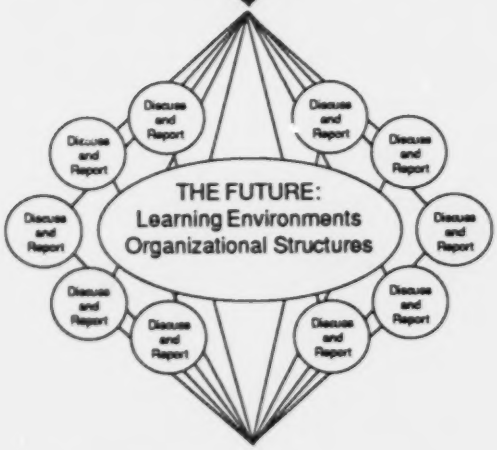
HEADLINER

Stephen C. Erhmann

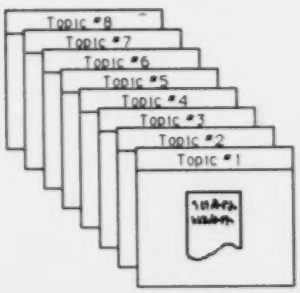
"Specifications and Strategies:
A Sustainable Investment in Technologies" 4



..... 14



..... 18



Alternative Funding for Technology Applications. 22
Integration of Learning Theory, Content, and Technology. 23
Library/Learning Resource Center of the Future. 25
Designing Computer Facilities. 26
Improving Access to Learning with Technology. 27
Where do we want to go? How do we get there?. 29
Classroom of the Future 31
Cross College Collaboration 33

BEST COPY AVAILABLE

Highlights of "Opening Remarks"

by Alfredo G. de los Santos Jr.

Facing the sun (but not the music) Alfredo gave a warm welcome to the retreat participants, who found themselves sitting on probably the hardest seats of their lives. The Technology Retreat '88 evolved from a series of meetings that Alfredo had during the past academic year. Visiting a variety of users groups, Alfredo shared his concerns about the uses of technology and the directions for the instructional uses of technology. In each case Alfredo asked for help in not only articulating the questions, but also in answering them.

Alfredo restated questions that have been worrying him for the benefit of the retreat participants:

- What is the instructional agenda for *technology* in our District?
- Who is in charge of that agenda? Who should be?
- What has happened as a result of all the money "poured" into computers/telecommunications? What are the instructional and organizational benefits?
- Are we in control of the teaching/learning process or are we driven/limited by what technology we have (or is available)?
- Have we defined what we need in the classroom or has that developed by default?
- Assuming that major changes will occur in the technology available to instruction, what do we do now to prepare and make better use of that *technology*?
- In preparing for a bond issue in 5 years or so, what will be the *common good* that every college will benefit from? Is improving the actual student work environment, retrofitting student computer labs, improving the instructional use of the space that *common good*?

Welcome

by Alan Jacobs

On behalf of the District Academic Computer Users Group, the Telecommunications Users Group, the Staff Development Coordinators, the Center for Instructional Technology and all the others through whose vision this retreat has been made possible, I want to welcome you to the 1988 Technology Retreat.

This Spring a quote appeared on Rita Richard's office door.. I believe it speaks directly to the reason we're here.

> "In the best examples a clever person makes the computer obedient. In the worst, an obedient person hopes the computer is clever."

If I were to state my own hope for this retreat in a sentence, it would go something like this: That in this retreat we rededicated ourselves to the goal of pursuing the best uses of technology – where clever people make technology obedient.

My focus is primarily instructional. We want to help students become smarter. We want them to acquire an appropriate body of knowledge. We also want them to become facile in the 'tools of their trade.' But not just facile; we want them to become clever in their uses of all the tools at their disposal; whether physical tools like microscopes, paint brushes or computers, or intellectual tools like critical thinking and problem solving skills.

I hope in this retreat to deepen my own understanding of just what it means to teach students to be clever, and not simply obedient, in their uses of computers.

I hope in this retreat to broaden the context in which I view computer instruction and usage. An finally, I hope that this retreat will not simply be a wonderful intellectual exercise. I hope for tangible results.

The Maricopa Community Colleges have made strong commitments to the acquisition and utilization of electronic technology. Technology is part of our present and will be a part of our future. As the retreat logo shows, technology is here in the midst of us. And it looks like it is here to stay.

Does the computer in that logo look to you like an intruder? Does it look to you like it has elbowed its way into the picture? Or is it a welcome sight? An "About time! " A "What would I do without it! " Or is it, perhaps, some uneasy combination of these two points of view? While the logo is neutral on these issues, it does declare unequivocally that computers and related technologies have changed the landscape. Does it belong is no longer the question. How do we use it? How do we work with it? How do we make it work for us? How can we be clever in its use? How will the way we do things change? How will we build instruction and an instructional institution upon technology? Those are some of the questions this year. As the logo shows, we are already building upon that technology. We need to learn to do that deliberately.

But what strikes me hardest about the retreat logo is the life-less-ness of it: not just the computer image but the buildings as well. But that life-less-ness is the key isn't it?

It reveals our opportunity and challenge: to bring life and energy and vitality to that landscape. To be clever in our uses of those buildings and those networks of buildings; to be clever in our uses of those computers and networks of computers. To be clever in our use of the institution of the Maricopa Community Colleges and those pieces of the institutions over which each of us exert influence. And, said directly, to provide instruction through which students will learn to be clever in their uses of technology.

And so I welcome you to the Technology Retreat '88. I welcome you to bring your life and energy and vitality to this retreat. I welcome you to be clever ..and perhaps just a little bit obedient.

To that end let me give you an overview of the retreat. During this afternoon and tomorrow morning we'll alternate between meeting as a large group and in small groups. The large groups sometimes will be used to encourage consensus, other times to foster dissent and debate, and sometimes we'll just sit and listen.

This afternoon after Steve Ehrmann's presentation, we'll have one large group session and two small group sessions.

This evening after supper the only planned activity is that there is no planned activity. We hope you will relax and unwind as obediently as you know how.

Based on today's discussions, a set of major interest areas will emerge. Tomorrow, instead of remaining with your cabin group, you will choose a small group that will address a particular area of your interest. Some of the possibilities are "Technology's impact on district politics and structure", "The challenge of technology for building design and remodeling" or "Curriculum reform."

At this time I'd like to introduce Gary Allhiser to you. We've asked Gary to provide instructions for the various group activities both this afternoon and tomorrow and to serve as a Master of Ceremonies. You will see a lot of Gary later. Frankly the rest of us who were involved in planning the retreat are just too shy for this kind of work.

We are going to publish the proceedings of the retreat. Its name, A Guide for Planners, shows that we want more than an historical record of our 27 hours here. We intend that the results of the retreat will carry forward in all areas of planning.

Not only are we going to publish the proceedings, but as you leave the retreat you will receive the entire proceedings. In fact you will get today's work this evening. How are we going to do that? We've provided each cabin with a Macintosh computer and a Laserwriter. But how are we going to get the proceedings out? We are asking you to be clever! That is one of the matters Gary Allhiser will explain more about later.

An now it is my sincere pleasure to introduce to you Steve Ehrmann, the keynote speaker. Dr. Ehrmann will not only give us the tuning note to start today, but will have several other opportunities to keep us on pitch. Dr. Ehrmann is the Program Officer for Interactive Technologies of the Annenberg/CPB Project of the Corporation for Public Broadcasting. He has been a program officer for FIPSE, the Fund for the Improvement of Postsecondary Education. Over the last twenty years his work has focused on three major themes: Applications of technology to liberal and professional education, practices which help colleges become more innovative and self-directing, and the methodology of evaluation.

Specifications and Strategies: A Sustainable Investment in Technologies

Stephen C. Ehrmann
Program Officer for Interactive Technologies
The Annenberg/CPB Project[1]

Why pay attention to the applications of technology to education? One compelling reason: that is the way the world is wagging. Professions, disciplines, avocations are all changing because of the ways in which they are taking advantage of technology. Technologies are tools for thinking, and professions and disciplines that use technology begin to think differently. Which in turn makes it important to continually rethink parts of the curriculum.

When I joined the FIPSE[2] staff in 1978, however, technology wasn't on my mind. I did care, however, about problems like balancing theory and practice, engaging the student's full spirit in learning, and serving a wider range of students. Not that any of these problems can be completely solved. But from time to time such dilemmas, and our attempts to deal with them, blaze up again. Around 1980 the winning proposals at FIPSE seemed more and more often to use technology to try dealing with these perennial problems. So I hauled my computer background out of the trunk and started thinking again about technology. Whatever your motivation -- a desire to equip students for a world where thinking is changing, or a desire to deal more effectively with some of the perennial problems of higher education -- I think you will agree that we cannot afford to ignore computers. *What* do with them and how to pay for it is my topic today.

Six Specifications for Dealing with Perennial Problems

We have all seen educational reforms that bloom in the spring and are gone by fall. An educational revolution has to do at least two things: accomplish a worthwhile object, and survive and grow. I suggest that our thoughts about computers and the curriculum can and must meet six specifications, two of them goals and four constraints:

---

[1] This essay is a summary of keynote remarks first made at the Technology Retreat of the Maricopa Community College District at Mormon Lake, Arizona, in May 1988, and then in revised and extended form at the Sixth Annual Institute on Telecommunications and Higher Education New York University. The content of this paper does not necessarily reflect the funding priorities or policies of the Project. Guidelines and information about funded projects can be obtained by writing to The Annenberg/CPB Project, Corporation for Public Broadcasting, 1111 16th Street, Washington DC 20036. The author can be reached there at 202-955-5273 (BITNET: EHRMANN@UMDC).

[2] FIPSE=Fund for the Improvement of Postsecondary Education in the U.S. Department of Education, where I worked as a program officer from 1978-85.

a) Enlarge who can learn (I mean raw access -- numbers -- but also major improvements in persistence and in the variety of learners served)

b) Improve what students learn, from the faculty member's and student's point of view,

c) Change a student's program, not just a few moments within that program. Education is something that adds up, in experience after experience, course after course. Many suggestions for using technology assume that it can make a difference by radically improving several hours worth of a student's education. I don't believe that, but I do believe that there are cost-effective ways to use computing that can leverage pervasive change in the curriculum. The forthcoming report of the FIPSE Technology Study Group[1] suggests three ways to use affordable technology with pervasive consequences: (1) employ computer-based tools and resources that students can use in course after course, and then after leaving college, (2) open up instructional bottlenecks, such as helping students to understand what a mathematical function *really* is, so that their later learning can be more effective, and (3) rework the content of a cluster of courses, so that any improvements in learning can be more readily apparent, and exploited.

d) Employ an evolutionary, rather than revolutionary, strategy, involving technologies which faculty can tinker with, even moment by moment, as the class goes on; avoid investments which are current today and obsolete white elephants tomorrow.

e) Be a good trading partner with other colleges and relevant institutions -- no one ever sustains a major educational improvement on their own. Export ideas in order to import reinforcements.

f) Grow. If the preceding goals and constraints are met appropriately, the most important goal/constraint of all can be met: the strategy must elicit returns of money, energy, and other resources sufficient to support the next, larger generation of educational improvement. The work of the early 1990s should enlarge the pie to support the work of the mid-1990s.

WHEN IS A REVOLUTION NOT A REVOLUTION?

I think it is particularly important to emphasize the sixth specification: "earn a return." I recently attended a conference of some of the developers of the really great software of the last few years. Their demonstrations, and their

---

[1]The FIPSE Technology Study Group, *Ivory Towers, Silicon Basements: Learner-Centered Computing in Postsecondary Education*, McKinney, TX: Academic Computing, 1988.

feeling for students, were superb. But several of them seemed at least half-way defeated. Their talks were littered with comments about a lack of support for the next generation of their work, and a lack of recognition at tenure time for the previous generation.

This did not sound like the stuff of "educational revolutions" (a frequently used phrase in this meeting). Much of the software had, in fact, evolved in the hothouse environment of major grants from colleges, foundation or government. What these speakers were saying in effect was that although their software was probably quite effective, in the normal climate of the university it could not survive and give rise to a new generation of software and better teaching.

> *Unless our strategies for applying technologies to academic programs give rise to returns which can be applied to creating more and better improvement in the next generation, there will be no educational revolution.*

Fortunately, the continuing spread of computers and other personal technologies on campus indicate that a revolution of some sort *is* going on. What is required if it is to be an *educational* revolution?

A Strategy for Using Technology That Could Meet the Specifications

Those six specifications may seem impossible to meet, so I owe you an "existence proof:" a strategy which offers at least a hypothetical chance of meeting them.

If we're looking to support a revolution, it's worth asking where one already seems to going.[1] The signs are that the most rapidly spreading student use of computing is as a tool/resource. Word processing is by the far the dominant use, but one can also look to computer-aided design, statistical packages and spreadsheets, open-ended simulations, and, coming out of nowhere, hypertext and other advanced database applications. Added to text and numbers are new multi-media capabilities, including increased use of video and sound. So in effect the technology is enlarging the student's reach into the intellectual world.

This is a far different image of learning than the traditional shotgun/broadcast of knowledge, with the faculty firing volleys of knowledge across the lecture hall or into the dormitories via assignments, trying to make a dent in student heads. The traditional model of computer-aided instruction merely tries to automate and individualize the teacher, but retains this "replicate the knowledge or skill of the faculty in the student" model. That old model has its limits. Research has indicated that retention from lectures is low, and that learning is often of a low order (memorization, routinized skills).

---

[1] "I must find out where my troops are going so that I can lead them," as a general is reputed to have said.

The tool use of technology is educationally promising complement to more traditional techniques. Students can use those tools to attempt new kinds of intellectual tasks, think about the results of the attempt, and try again. The computer and its adjuncts offer more data, more power to manipulate real and simulated realities, drafts that are more readily analyzed and revised: in short, more of the tools of scholarship in forms which can be used by students.

But there is a catch.

The traditional student will flounder when confronted with so many choices. Students who have spent most of their intellectual lives sitting quietly in lecture, alone doing homework, alone at the computer, will have a hard time gaining the sophisticated skills and new insights to deal with this strange new world of knowledge and power. To put it another way, college is aiming to introduce students to communities of knowledge: professions and vocations which create and validate learning. Students need to interact with other novices and with the members of those learning communities in order to learn to see the world as they do. Rote skill might be acquired alone, but perspective requires company.

Whichever argument suits you better, both lead to the same conclusion:

> *The more power we give students, the more they need to converse with other human beings in order to use it.*

A human being struggling to learn what it means to design something, or to analyze a new kind of problem, has a continual need to converse:

> "Could you explain this point? I don't quite understand it as well as I'd like."
>
> "Can you come over here a minute and look at this? What do you think of my work to this point?"
>
> "Hey, how would *you* do this part?" and
>
> "Can you come right away and look at what I just made!"

The conversations generated by questions like these are essential to the development of engagement with the materials, of higher order skills, and of the ability to creative work with the material.

If we fail to give students that kind of support, many experiments with these new tools and resources will yield disappointing results: students will search for simple, unambiguous pathways, and they will find them. They will use word processors to make papers look pretty, hypertexts to anticipate questions on the test, and open-ended science labs to do cookbook experiments.

Let's pause for a moment and see where we've gotten ourselves, too. Students need a variety of messages and materials in order to learn, and always have. Today those range from the words of a lecturer to library books and computer diskettes. When those materials reach them, we expect students to interact with them, to have, in effect, a conversation with them: "What did she mean when she said that?" "What might the author mean by this point?" "What would happen with this experiment if I did it this way instead?"

But in order to learn those skills of conversing with materials, most students need to converse with other people: to ask questions, try out ideas, and share the emotions of the quest for knowledge and achievement. Computers give us better materials, offering students more choices, but that means that the conversation with other people needs to get better, too. Students traditionally carry on two quite different conversations with other people: the live conversation of the seminar room, the faculty office hour, and the bull session, and the time-delayed conversation carried on with homework and other projects. The live, or timely, conversation supports spontaneous, rapidfire communication. The time-delayed conversation is necessary when each participant needs time for sustained thought and work before responding.

So there are really three conversations that characterize liberal learning (Figure 2):

a) the isolated student's conversational interaction with the materials and one-way messages of instruction

b) the timely conversation with human beings; and

c) the time-delayed conversation with human beings.

Armed with that framework, we can predict that computer-based tools may be spread rapidly, but alone they will not accomplish the educational revolution that would satisfy our six specifications, because they support only one of the three conversations. We will need a balanced improvement in all three.

Let us use the computer as a gateway to the three classic academic conversations (Figure 3):

1) the materials conversation, where the power of computer-based tools and resources can be complemented with the didactic flexibiity of videotape[1] and computer-aided instruction;

---

[1] One intriguing application of videotape is to give students more choice in when and where to get help from a lecturer. We know that if students are to have more time to explore the uses of these tools, and to learn from that experience, the time allotted to straight lecture must somehow be lessened. Videotaped mini-lectures and demonstrations may be part of the solution.

2) live conversation (carried on by audiographic conferencing,[1] for example); and

3) time-delayed conversation (file transfer and asynchronous computer conferencing).

At the Annenberg/CPB Project, we're now seeing institutions using each of these technologies and early signs that some institutions will soon be using them in combination.[2]

CAN THE "THREE CONVERSATIONS" STRATEGY MEET THE SIX SPECIFICATIONS?

To my knowledge, no academic program has yet attempted to provide its faculty and students with the technologies to support all three conversations,[3] but there are some clues that such a strategy might meet the six specifications.

a) Several institutions employing timely and time-delayed student-student conferencing report dramatic improvements in retention, within and between classes. If this is generally true, it may be due to improvements in both social and academic support. At any rate, I've heard a number of stories about attrition rates sinking virtually to nothing, and students protesting being dropped from a class. Other institutions are using conferencing to reach distant learners who never would have enrolled for on-campus courses.

b) Outcomes can certainly be improved where students must learn to think as (computer-using) professionals in their fields do. The jury is still hearing evidence on whether outcomes can generally be improved when students use computer-based learning tools.

---

[1] In a computer-based audiographic conference, computers are linked together through through the telephone system and an "audio bridge." Participants are in touch through a high fidelity conference call, while simultaneously sharing the same screen image. Some systems allow users to see one another's cursors, call from a common store of graphic or even video images, share snapshots of screen images from one participant's off line use of a program and so on. The Annenberg/CPB Project has sponsored the development by Harvard of a calculus course for distant learners, and a University of Maryland study of audiographic conferencing applications in college education in the U.S. and Canada.

[2] This "three conversation model" and some relevant A/CPB-funded projects are described in more detail in a longer working paper entitled, "Technologies for Access and Quality: An Agenda for Three Conversations"

[3] Faculty and students would need, at minimum, access to computers with modems and to some form of synchronous conferencing (conference calls, audio conferencing, or, better, audiographic conferencing so that the group can see what it is talking about). The institution would need to provide access to a computer conferencing system (not necessarily at the institution). None of these requirements require an inordinate investment or cutting edge technology, but so far I know of no place that has put the pieces together for a single course or program and used them to teach better.

c-d) Productivity tools, hypertexts, and conferencing can be implemented incrementally, tinkered with, and used for strategies of pervasive change across the curriculum. When students in a history course, for example, use word processors and databases to do assignments, it does not even matter whether they all have the same machine. Nor is the faculty member irrevocably tied to one particular strategy or body of content.

e) Technology users are generally eager to trade ideas and, even better, the new telecommunications and database software can make trading ideas between institutions faster and easier.

f) Generating a Return

At least in the beginning, the college that wishes to generate a "revolutionary" return will need to focus at least some of its computing investment in programs where improvements in access and quality are most likely to be visible and valued enough to yield those new resources.

There are several areas where the returns may be great enough, and visible enough:

a) Academic programs which prepare large numbers of students for a limited number of career placements, e g. where a few large companies or colleges take a large number of graduates. Those employers or graduate schools should be able to detect whether there have been revolutionary improvements, and provide appropriate rewards.

b) Decreasing attrition and/or increasing enrollment.[1]

c) Common (in)competences among students in areas such as writing and quantitative reasoning, which historically have impeded learning in many courses. If learning bottlenecks like these can be opened, teaching and learning become more effective for everyone.

WHAT IS THE DOWN SIDE?

No strategy is perfect. If implemented, what problems might this strategy encounter, or cause? Here are three of my favorite challenges:

a) Technologies change quickly, but this strategy requires substantial improvements in the day-to-day teaching of many courses; such changes are

---

[1] See the discussion, above, concerning possible affects of student-student networking on attrition.

likely to spread only slowly. Will the shifting technologies constantly render the teaching improvements obsolete before they reach any critical mass? How can we create a *modus vivendi* between these two paces of change?

b) Pursuing the "three conversations strategy" will surface the central tension in the technology community: the conflict between

* the desire for autonomy that attracted many people to computing and

* the interdependence and common standards needed to use technology to improve academic programs and to maintain communications between systems.

c) To earn a return someone with resources has to appreciate what has been achieved. But a 20% improvement in the quality of teaching or learning may be impossible for employers, graduate schools or others to detect in current circumstances. What kinds of changes in evaluation or other practices might make quality improvement more reliably rewarding?[1]

CHOOSING A STRATEGY

No single person in any college I know has the mandate to choose a technology strategy, "three conversations" or otherwise. Instead, such strategies emerge from a combination of historical accident and informed debate. I hope these thoughts may help that debate along.

---

[1] *Ivory Towers, Silicon Basements* (op.cit.) has some suggestions in this regard, as does a recent article of mine, "Assessing the Open End of Learning: Roles for the New Technologies," *Liberal Education*, LXXIV:3 (May-June), pp. 5-11.

Access to Resources: The Technologies
Stage I ≈1970

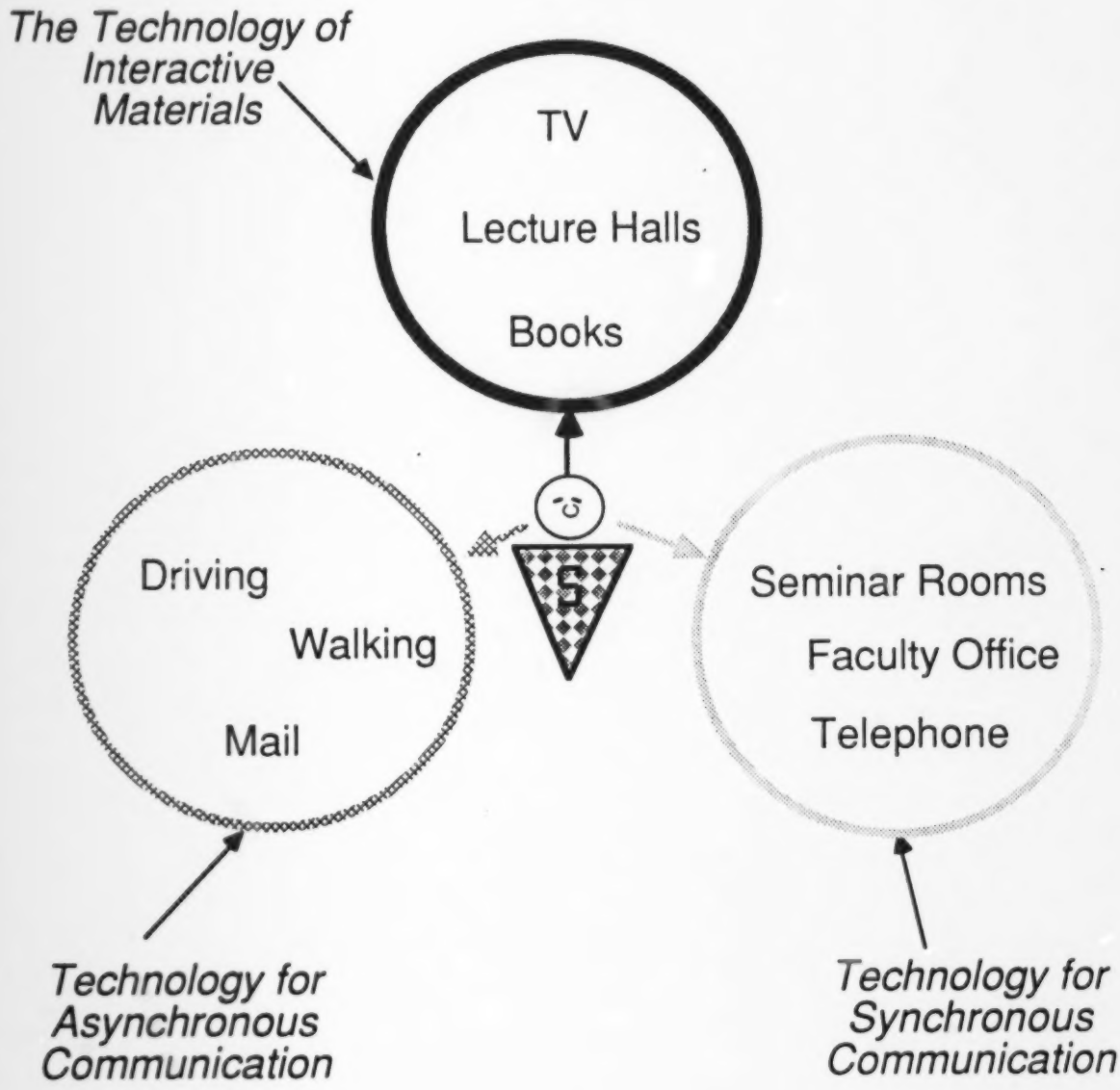


Figure 1

© Ehrmann, The Annenberg/CPB Project 5/12/88

Access to Resources: The Technologies
Stage II ≈1990

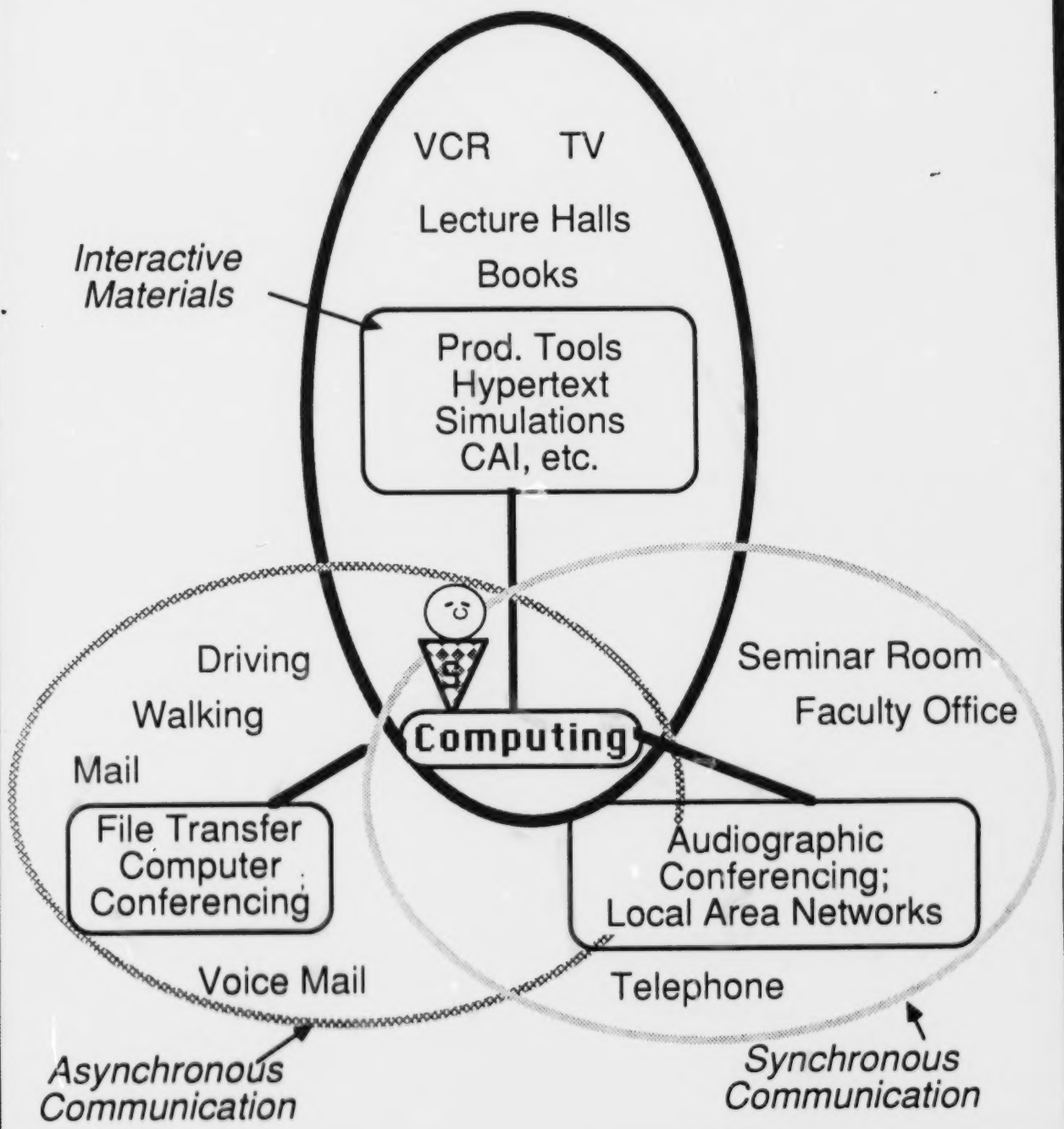


Figure 2

© Ehrmann, The Annenberg/CPB Project 5/12/88

Diary of Facts, Opinions and Feelings About Learning, Technology & Organizational Structure

In a small group setting, retreat participants wrote statements about how students learn, about the present implementation of technology, and about the present organizational structure. The following four pages record the collection of those statements from each of the small groups.

How Students Learn

- Students learn from what they learned before.
- There's no one best way to learn anything.
- Students learn by practice and application; trial and error.
- Students must have a reason for learning.
- Some learning is accidental.
- People learn from one another; informal/formal modeling.
- Learning is multi-sensory.
- Students learn by lecture.
- Students learn by interaction with other students.
- Students learn by a facilitator approach.
- Students learn with CAI.
- The learning process is content idependent.
- Students learn in open entry/open exit programs.
- Students learn with tele-training.
- Students have different styles for learning.
- Students learn by "mapping."
- Students learn by integrating new information with what they already know.
- Students learn by reading, observing, listening, experimenting, application of theories, intuition, practice and memorization.
- Many students are comfortable learning with TV.
- It's possible to accomodate different learning styles and instructor styles and STILL take advantage of technology.
- Students learn by practice, repetition, trial and error — these activities are common to all learning styles.
- Relevance and interpretation are common to all subjects but can vary significantly depending on the particular student and instructor.
- Students learn by asking questions.
- Student learning is facilitated when the learning environment is tailored to them.
- Students learn through interaction with peers.
- Students learn from homework.
- Students learn from experiments.
- Students learn from reading.
- Students learn by identifying relationships between new material and what they currently know.
- Students learn by doing.
- Students learn through various senses.
- Students learn in small groups.
- Students learn from lab experiments.
- Students emotions/feelings affect their learning (enjoyment, self-fulfillment)
- Students learn through struggle and discovery.
- Students learn by choosing their own experience and from teacher chosen experience.
- Students learn in the context of their self-concept environment.
- Emotional climates affect student learning.
- STUDENTS LEARN IN MANY DIFFERENT WAYS.
- Students learn by practicing, observing, sharing, discussing, exploring, questioning and peer tutoring.
- Students learn by revisiting content ("spiral" learning concept).

- Students learn from a variety of learning styles (5 senses).
- People are ALWAYS learning.
- Students learn by memorizing, repetition, solving problems, through visual stimuli.
- Students learn by doing, reading, writing, listening, hands-on experiencing.
- Students learn what they're interested in and what they NEED to learn.
- Students learn by mastering course competencies.
- Students learn through concrete experiences because they are concrete thinkers.
- Students are less prepared than in the past and are "now" oriented.
- Diversity is an important element in the learning process as is motivation.
- Age and maturity affect learning.
- Students have different cognitive styles and learn by "crunch learning."
- Learning is primarily in traditional mode w/ pockets of innovation.
- Students learn best by identifying with super-teachers (opinion).
- We assume that students have made choices about what to learn.
- Students learn by accessing information sources.
- Learning styles are affected by ages, time for homework, experience and culture.
- Learning is active.
- Motivation is the key to learning.

Statements About Technology in the Present

- MCCCD has over 4,000 instructional workstations!
- MCCCD has over 6,000 computer workstations in support services!
- MCCCD has a network of technology in place(75% wired Ethernet/100% telephone)!
- MCCCD has pipeline for video in place!
- MCCCD is not utilizing this network 100%...
- MCCCD is highly decentralized in methods of using technology.
- MCCCD provides support, training, equipment, sabbaticals, projects and professional growth.
- MCCCD's communication network investment has been worthwhile!
- Technology can provide immediate feedback, reinforcement.
- Technology can capitalize on different learning styles.
- Technology can help with evaluation.
- Technology provides variety.
- Technology works effectively when it is an integral part of instructional program.
- Technology is effective when instructional controls and not technology.
- Technology requires time and preparation.
- Technology cost$.
- Technology provides time for students to learn.
- Technology makes it easier to do research, writing, to merge concepts and to help students be successful.
- Watch out for today's third graders!
- Potential of existing technology is largely untapped.
- Technology is used in classrooms for research, word processing, drill&practice, video presentations, labs, testing, handouts, grading and record-keeping.
- Technology is used for drill&practice, simulations, problem solving and to tap information sources.
- Technology is used by instructors to change how they teach.
- Our communication network should be used to teach classes at more than one campus simultaneously.
- Technology is inplace, but administrative response may not be there yet.
- Technology changes visual simulations.
- We use technology to teach how to use technology.
- We use technology to teach things other than technology.
- Technology is sometimes used as a "fad"
- We use technology for resource-sharing (on-line library).
- Technology can eliminate time barriers.
- Technology for its own sake is not a tool.
- Technology includes overheads, laboratories, VCRs, etc.
- Technology can be used for show, motivations and incentives.

- Technology takes time and preparation.
- Technology is used to teach about technology, mimic textbooks (tutorials), as tools, to provide simulations, create "microworlds"
- Technology can be enjoyed or lead to frustration.
- Technology replaces inter-personal relationships, can encourage passivity and increase efficiency.
- Technology can increase information availability.
- Technology can provide an improved learning environment (air conditioning and lighting), act as a visual and audio aid.
- Technology raises expectations for quality products.
- Technology can empower students.
- Technology reduces student tedium (Wilson disk).
- Technology brings resources to classes which were not possible before.
- Voice mail increases student teacher interaction.
- Technology is used for information dissemination.
- Technology is sometimes used poorly or inappropriately.
- Technology can be central to a course or supplemental to a course.
- Technology allows us to use traditional methods effectively.
- Time saved by using technology but the time saved goes to amplify the traditional.
- Technology allows simulation, role playing and model systems to be easily used — can fundamentally change educational delivery.
- New presentation modes are exploding and seemingly unlimited.
- Computers cannot replace student's thinking.
- Telecommunication networks promise much.
- Technology could provide for an anecdotal presentation mode.
- The teacher assembles materials.
- The teacher makes it all work.
- If we are to integrate — technology or not — we need to agree on common elements.
- Technology offers quick trial and error learning.
- Students need time to absorb new technology.
- New technologies will appear — witness Hypertext revolution.
- Technology makes different rates of learning possible.
- What we value affects what we teach.
- We spend too much time teaching the computer as a computer rather than as a tool.

Statements About the Organizational Structure

- Time constrains creative use of technology.
- Knowledge too centralized — move from District!
- We lack sufficient by faculty on facilities design.
- Budget limitations impact use of technology.
- MCCCD lacks support for follow through.
- We perform limited critical evaluation of products.
- Need to improve dissemination of many things.
- We need decentralization of talent/support.
- We have limited research data on what's been done and how effective it was.
- We need comparisons and contrasts with other colleges.
- The organization has more than one layer.
- Yes, there is support.
- We learn better with competition than cooperation; we teach better with competition than with collaboration.
- Our organization promotes competition.
- We are so narrowly structured (both campus and district) that we cannot promote inter-disciplinary uses of technology.
- We do not have the support for technology! (We DO have the technology resources to bitch about.)
- Campus autonomy is a plus and a minus . (Isolation is a minus.)

- The organization provides capital telecommunication, computers and media services, staff development & training, grants.
- The organizaiton provides leadership, encouragement, sets expectations, supports sharing.
- The organization provides demonstration of new technologies.
- Organization provides trips (professional growth).
- Organization provides funds for technologies.
- Non-ownership of technology areas is a problem.
- The organization is flexible (meets changes).
- The organization provides support for innovations.
- There is lack of resources for follow-up and/or implementation.
- Organization provides college-wide planning forums.
- The organization provides verbs to use in preparing course competencies.
- We don't share enough.
- We're good!
- Not enough time.
- Collaboration will not happen under current funding/reward system.
- Some problems are more communicative rather than technological.
- We, they vs. us problems exist.

Future Students
and
Learning Enhancements for for those Students
Based on Technology

In a small group setting, retreat participants wrote statements about the future. What would be the characteristics of students in 1994? Their strengths and weaknesses? What role will technology play in enhancing learning in the future? How should the organizational structure change to better address the future?

The following four pages record the various ways the groups answered questions about the future.

The most important things students entering community colleges in 1994 need to learn:

- Critical thinking/problem solving skills
- Cultural Literacy/global awareness
- Written and oral communication skills
- Learn about "quality of life"
- Remedial/Literacy skills
- General education skills
- Learning to learn
- Tool technologies - reinforcement - open entry/open exit
- Critical thinking in support of the three R's

Descriptions of students (in the future); where they live, and what their strengths and weakness are as learners:

Type of student	Strengths	Weaknesses
• Remedial	Motivation Perservence Survival Determination about job skills	HS dropout 1- parent home Low rent Low self esteem Financial diffuculties Unrealistic goals Time commitments

(Descriptions of students (in the future) Cont.)

Type of student	Strengths	Weaknesses
• Re-entry student	Change of career Goal oriented Needs school for advancement Homemaker entering job market Life experiences High motivation Higher expectations of faculty	Job responsibilities Family responsibilities Variety of skills and literacy levels
• Computer literate student	Study skills Highly motivated Technology oriented	Expects more services Expects high caliber of instruction Hard to meet learning styles
• Yuppie	Adequate background	Would prefer to be at a four year college
• Low socio-economic status student	Motivated	Lacks study skills Needs financial assistance Lacks literacy skills Needs learning support
• Life long learner	Curiosity	Ill at ease with very young students
• Volunteer		
• Captive		
• Hispanic	Sense of community Strong family support	Language skills

---

Other characteristics of the future student:

- More computer literate
- Less prepared
- Less disciplined
- Older
- Wider gap between those who have children and those who do not
- More culturally diverse
- Less degree completers
- More certificates/awards
- More students in total
- More ESL students
- More older adult illiterate students
- Expectation of institutional flexibility
- More social consciousness
- Higher percent in basic skills

What we should do to facilitate their learning and what they do to learn these things:

- Consider where we deliver the instruction
- Consider how we deliver the instruction (satellite, television courses, home delivery)
- Teach to their strengths/weaknesses - what they need, on their schedule, where they are
- Inservice for faculty to deal with the "new" student: inner city schools need to be sensitive to cultural issues
- Decentralize more - campuses determine how to meet needs of their students
- Appeal to more learning styles
- Flexibility - ability to accommodate variety of students in a variety of ways
- Consider the role of remediation within programs and for general skills support
- Consider the student who may respond well to practical skills while not responding to remediation
- Address increasing diversity of student population

Ways technology can best support this learning:

- Individualize, reinforce skills
- Provide for sufficient cultural and socializing activities so that students from the widest variety of home settings can feel confident with the typical class interaction
- Be certain to teach how to find knowledge or answers to specific questions through the several channels open at the college.
- Teach critical thinking so that students can evaluate sources of knowledge
- Show how students can become communicators of knowledge in their own right
- Place knowledge in the context of:
  - a sense of community
  - global awareness
  - work ethics human relations skills
- Provide access (immediacy)
- Provide convenience

One vision of the Future

The traditional elements of the college scene will be unchanged, except there will be more of them. More teachers and staff in their offices, labs and classrooms; more traditional classrooms full of students. These facilities will be linked with ethernet to pull most technologies into any of the settings.

But the traditional learning environments will add on (to the ethernet link) the following settings:

The home - Via telephone or satellite, the learner in the home, both young and old, will attend classes through a remote link.

Homes in a network - Students attending class at home may also join in discussions with each other, exchanging their homework or class observations, sometimes time linked, sometimes time delayed as in computer conferencing.

The industrial or service industry training room - Via interactive links, including visual support (from slow-scan to multiple video channels), the training group on the job site will join a class in a classroom, or the instructor in his office.

Libraries & knowledge bases - Also on the ethernet, for access during class, during homework, or during instructor's preparation, public domain and commercial information sources would be reachable for any and all supporting information.

Neighboring states and neighboring nations - Via satelite links, either delayed or live, classrooms or homes in any location in the world would be brought within reach of the campus.

Ways the organization's structure and policy can be instrumental in providing technology enhancements to the learning environment:

- Provide for funding decisions at the campus level
- Provide training and support staff to accompany the enhancements
- Assure a shared "philopsophy" at all levels of administration, staff and faculty
- Cultivate a positive attitude toward innovation
- Seek alternative funding sources
- Accept that our increasing size will force improved coordination
- Consolidate those enhancements already shown to be successful, such as computerized registration
- Attach enhancements to initiatives stemming from other concerns; for example, thecapstone course could become a model for the integration of technology into the curriculum
- Facilitate the flow of information about technology's potential
- Promote orientation and mentors within Maricopa
- Facilitate continued motivation to fulfilling technology objectives
- Develop mechanisms for improving the design of classrooms and other facilities: e.g. lighting, terracing, other ergonomic factors
- Consider economies of scale, and backfill needs for our current technology enhancements
- Increase commitment to operational funds, support staff, supplies, repair ind replacement dollars, updates and upgrades
- Include depreciation and recapitalization in planning
- Include dessemination of expertise, support and resources
- Disperse concentrated expertise
- Disperse dessemination of information and training
- Change the FTSE formula
- Set priorities for resource allocation
- Focus on learning for our students rather than "national splash"
- Provide funds to fully implement programs
- Move toward program funding (rather than FTSE funding)
- Change the definition of FTSE
- Change the expenditure limitation
- Funnel decision making through realistic assessments
- Strengthen decision making and institutional resolve
- Make developmental courses 100 level
- Increase reliance on loans; decrease reliance on Federal grants
- Retain Staff Development under Educational Development
- Develop stronger communications structure
- Develop mini-Centers for Instructional Technologies (CIT's)
- Use the faculty computer literacy model for training

TOPIC: Alternative Funding for Technology Applications

Group Members:
Angela Ambrosia
Dan Whittemore
Mark Butler

CASE STATEMENT:

Currently, MCCCD has focused technology as a major emphasis for the future. The District has successfully received major new dollars for new capital. However, the District has insufficient allocations for operating cost for new technology advancements.

There is a serious **need** to acquire new alternative financing sources for operating costs.

RECOMMENDATIONS

1. Focus a **Grant Writing Unit**.

The District needs to focus a grant-writing administrative unit to continually attract new grants. Research on the availability of grants for specific projects. Currently, this is done on an ad-hoc basis as ideas are conceived and as time is available.

Persons should be identified to coordinate this function district-wide.

There are many available funding sources which have not been tapped. These sources include, but are not limited to:

- Private foundations.
- Public foundations such as Annenberg/ CPB and National Science Foundation.
- Public school districts.
- Public agencies, such as specific United Way agencies.
- Joint venture research with Universities and corporations.

2. Develop More **Cooperative Efforts** with Third-parties.

Research grants should be developed in corporation with the telecommunication industry (i.e. phone company), major technology vendors, and software companies.

Consider incubation projects to assist emerging companies with a future payback with stock and other incentives to the District.

Joint ventures with school districts, other educational institutions, agencies, and providers of educational material.

3. Become **More Efficient** with Current Resources.

The District need to expand clearinghouses to share software, successes, and experiences. Projects funded from Visions and other funding sources need to be shared with all colleges and should be made available for district wide use.

Videotext could become the media for widely sharing this information.

Receive new revenues by leasing uncommitted computer time and facilities to organizations at reasonable cost. The District could therefor recover overhead and operating costs.

TOPIC: Integration of Learning Theory, Content and Technology

Group Members:

Diana Hutchinson
Carmen Coracides
Tom Trollen
Chuck Bedal
Bud Sessions
David Weaver
Ed Chandler
Betty Field
Phyllis Muir
Dorothy Wooley-McKay
Rosemarie Hansen
Mike Rooney
Jim Hogan
Jeremy Rowe
Laura Helminski
Don Snow
Mary Alcon
Betsy Cooper
Gene Schmidt
Alfredo de los Santos

I. **RESOURCES**
   A. People
   B. Time
   C. One-time shopping to avoid frag mentation
      Bulletin board
      Video tape

II. **LEARNING ABOUT "LEARNING"**
   A. Learning/curriculum theory
   B. Adjunct faculty
   C. Staff development

III. **COURSE CONTENT**
   A. Tools vs. application in terms of technology
   B. Technology driving content
      1. Math
      2. English
   C. Interdisciplinary activities
      1. Instructional Councils
      2. All faculty convocation
   D. Content tracking
      A. High School
      B. Industry
      C. University

IV. **INSTRUCTIONAL COUNCILS**
   A. Redefine the role
      1. Development awards (foster ing innovation)
      2. Channeling of information re sources
      3. Operation arm of educational development
   B. Cooperation/communication
      1. CIS and Journalism fighting over DTP (example)
      2. CIS making all the integrated packages under CIS

V. **OUTCOMES DESIRED**
   1. Need for incentives for faculty
   2. P.R. for need/value of the group to motivate and redirect groups to showcase and highlight results
   3. Need to redefine district's role in providing direction, support & philosophy for the councils
   4. District funding for specific re treats for academic and content areas

VI. **DOING IT AGAIN THOUGHTFULLY**
   A. Depth vs. breadth (content jam)
   B. Definition of "DIAT"
      1. Encouraging students revisions
      2. Faculty rethinking use of technol ogy
   C. Using students as resources/critics
   D. How do we learn "How To"

4. Consider Specific College **Fundraising Tasks** to Augment the Maricopa Community College Foundation Efforts.

College staff should solicit funds for specific college projects, such as changing the technology methods for the medical courses, from professional organizations, interested businesses and organizations.

Consideration should be given to an annual District-wide Technology Convention where participants pay for educational workshops and seminars and vendors of hardware, software and related technologies exhibit for a fee.

TOPIC: Library/Learning Resource Center of the Future

Group Members:

Conrad Bensyl
Laurita Moore
Sharon Howard
John Gray
Carmen Coracides

Changes will remove some of the road-blocks for Library users by allowing greater use of
free term vocabulary... end user will no longer be limited to structured language .... greater availability of information re-sources... Boolean access...

View Sculley tape... Universe of information at your fingertips... Hypertext type organiza-tion...
available via networks...

Need to be aware of and design appropri-ate mix of centralized vs. decentralized resources...
leveraging of resources across entire Dis-trict... repositories of resources...

Once available having enough stations, ports, dial-ups (home access for students, faculty and community) and resources to meet demand... how much is enough???... appropriate algorithms to provide access... resource sharing... keeping up with growing needs and usage...

Image and full motion delivery and man-agement via network... more alternatives to print...

Continuing need for warm, friendly helpful bodies... additional sources of help via telephone, expert systems, help windows, on-line, well designed screens...

Designing Computer Facilities

Group Members:

Don Bradshaw
Jim Jacob
Gilbert Gonzales
Verline Rader

Make recommendation to CDEC and ITEC that a consultant be retained to:

1. Review construction plans to insure that requirements for dealing with data, voice, and video hardware can be addressed.
2. Conduct sessions with ITEC, CDEC, Planning, M&O, etc. to develop criteria to be used in future planning
3. Establish list of architects who specialize in designing and selecting standards for technology facilities
4. Establish a District advisory group for ITEC and/or CDEC to review technology facilities planning and function as thinktank for future planning of information services delivery to students, faculty, staff, and administration.
5. Add a member to CDEC to function in a role similar to the one played by the ASU representative on ITEC. This individual could be from the corporate community or another educational institution with a strong background in technology-based facilities design.

Future facilities planning should address the following issues:

- cable management
- lighting
- security of hardware
- ergonomics
- environmental (heat loading, etc)
- flooring
- carpeting
- entrance conduit
- grounding potentials within and among buildings
- power requirements
- use of power distribution units
- use of uninterruptible power supplies
- connections between video and data systems
- projections system which can deal with both video and data
- aesthetics of installation hardware
- design of space around workstation
- workstation furniture design

TOPIC: Improving Access to Learning with Technology

Group Members:

Jan Baltzer
Pinny Sheoran
Joyce Mulholland
Carol Scarafiott
Janet Gesin
Mary Lou Mosley
Naomi Story
Steve Ehrmann
Liz Warren
Andy Bernal

Access to learning using technology has these aspects:

1. taking learning to students in remote locations or in their homes using technology as a delivery vehicle;
2. bringing external resources into the "traditional" classroom using technology.
3. access at college at other times.

MCCCD needs to continue building better relationships with the community to encourage access to our institutions. Technology needs to be merged into this effort.

MCCCD library resources are technically available to the community via the data network and the library automation system, but this availability is not marketed or promoted as much as it should be.

Not all of the technology which we have available within MCCCD is available to the general community (i.e. computing and video resources). We need to increase this availability/accessibility. We teach students to use technology but if students don't have access once they leave the campus they lose the skills they have learned.

The external community, in general, has no idea the amount of technology we have available for community use. The internal community also doesn't know what technologies are available or how they are being used to further access to learning and resources.

Can local industry be approached to assist in funding the additional computer power or telecommunications "pipelines" necessary to make access to our internal resources possible for the community at large? (i.e., could a local industry pay to have a telephone line installed into the VAX so that they could access the library system?)

We must continue to address the issue of affordability of technology. We cannot require our students to purchase computers in order to complete a course of study. We need to pursue check out programs or leasing of equipment to students who fall into the "have not" category.

Student support systems and faculty training are essential if technology is to be successfully used to expand access to learning. A conscious effort must be made to develop the orientation materials, instruction, curriculum design that is necessary to give the students a successful experience. Faculty must be properly and thoroughly trained on how the technology works and how the students will utilize it to access information.

Computer conferencing should be used to train faculty in the use of technology. (i.e., faculty could take a course on how to include technology within their courses using computer conferencing as the training vehicle)

Keyboarding skills are going to become increasingly important for both students and faculty. We need to find some type of mechanism to build this skill-building into the curriculum of a given course or into the orientation to that course. This is particularly true when the vehicle for delivery is to be computer conferencing.

A combination of network access to the library automation system and computer conferencing would be a perfect way to teach writing courses.

We need better information within the internal community on who is doing what with technology. Many technologies are available and are being used in very innovative ways, but the information about these applications is not readily available to individuals at other colleges or within other departments.

Faculty and staff want to learn more about how to use technology to reach potential students and to retain those students once they have enrolled in a course of study. Recruitment and retention are very important.

Sharing of resources/data bases with ASU and other public/private libraries is a must. We have the technical capability but we need to work harder to make this happen.

There is an increasing use of video-based materials which can be checked out by students for review at home. Textbook publishers are providing "how to" or "review" videos with textbooks and giving institutions duplication rights that make this possible. Where this type of resource is not commercially available, individual faculty and easily and inexpensively produce materials. The prevalence and inexpensive availability of video cassette recorders/ playback units make this a good technology for expanding access to learning.

CD-ROM is a new technology which we need to use. Individual and group access to resources/databases will be vital. As we are able to also access this type of resource over the communications network, increased usage is expected.

The biggest concern is that we already have so much technology available within the District but people don't know what is available. We need to make a concerted effort to educate our internal community and to train them to use the technology appropriately.

TOPIC: Where do we want to go? How do we get there?

Group Members:

Ray Bruns
Mark Montanus
Margaret Hogan
Rita Richards

I. **Background**
Our efforts to integrate technology to date have been scattered and somewhat haphazardly developed. There should be a more uniform planning process. College strategic plans should reflect the direction and steps for technology development. As important as planning is, the process of technology does not begin with a plan, it begins with a dream, a germ of an idea of an innovator. Our system has to ferret out and support innovation and the innovator.

II. **Brainstorming Activity Ideas**

A. All disciplines should have equal opportunity for the technology, which we see as more than computers and which is in support of instruction, instructional management, and administration.

B. We need a system that allows for training at all levels, not just for use, but for integration of technology into our everyday operational mode.

C. We see the classroom of the future as providing the best technology, unobtrusive, easy and comfortable to use. Faculty need to be able to demonstrate within the classroom the use of technology for their field. The environment must extend beyond the 50 minute period and the classroom walls. Students should be able to see a demonstration in the classroom, experiment themselves with being the teacher, continue working on projects after class in an open lab where content experts are available to work with them.

D. Development of courses with integration of the technology requires teacher time and instructional design support. We may need faculty to spend more time on development and less on routine tasks, like grading and course management details.

III. **Recommendations**

A. Technology should be used to free up teachers to specialize. Do we have software developers, instructional material designers/developers, lab/tutorial facilitators among our current faculty The "service" faculty concept could provide resource persons to other faculty as long as the department does not suffer from the loan of their person. Faculty roles need to be redefined.

B. There is a need for more campus cooperation within and without the district. Within the district, there should be some way to loan expertise from one campus to another—not only the model they have developed, but the person who has developed it. The Director of Information Technologies could take the responsibility for clearing the way with the Vice-Chancellors.

C. We recommend access to computers for all students whether they are enrolled in courses requiring computer use or not. We recommend extending access to high school students who do nothave computer in their schools.

D. Innovators should be rewarded. We recommend that "Innovators of the Year" receive funds for the year following their selection to support a project of their choice. The District Innovator of the Year should receive $10,000 and College Innovators should receive at least $3,000.

TOPIC: Classroom of the Future

Group Members:

Chuck West
Holly Beene
Larry Bunting
Linda Larson
Steve Cooper
Claire Keyworth
Judy Leslie
Mario Esquer
Kay Martens

Assumption: It is the responsibility of the comm. college to determine the teaching/ learning environment
Assumption: Younger students are image learners (MTV)
Assumption: Different teaching delivery systems require different environments

A beginning: Redesign community college course for the new teachers— Successful use of technology requires skill in use of technical tools, redesign content to 2 primary areas 1. "how to present materials, presentation skills —technology for communicating information" and 2. how to teach the adult learner. Get the faculty ready for use of Technology. Ask experienced faculty to develop course content as to relevancy to community college teacher.

Needs to be done: to prepare for future classroom:

1. Recognize and overcome barriers:
   a. imited resources
   b. limited training of faculty etc.
2. Need to communicate: What's out there—current state of the art to faculty. Need to promote exploration of options. (thinking/tinkering time=TTT)
3. Need to develop strategies to work with those faculty who are not hi tech users and are working within comfort zones. Information overload makes it difficulty for faculty to connect into the immediate need.

To develop the classroom of the future the group recognizes that:

1. Technology is a communication form and not simply technology
2. Technology needs to be flexible as does the teacher
3. Basic priorities need to be addressed
   a. the physical plant i.e. classroom needs to accomodate both low and hi tech (it must also be regularly cared for w/ cleaning, painting, roofing)
   b. Support in terms of $ & personnel
4. Planning process to prepare for hi tech is critical
5. Levels of sophistication of technology will be based on purpose/function of individual classes

Classroom of the future:

Classrooms will be of different designs to meet the various teaching learning styles—there is need to break out of a single traditional classroom box

1. Classroom in the round
2. Use of a variety of tech equipment "fixed" in place and remote/wireless

3. Use of Teaching Console e.g. computer, display system, graphic pad for teachers. Students would have work stations with special equipment for handicapped (audio, enchancement etc.) Unobtrusive computers which would be recessed to provide visibility, eye contact and increased work space
4. Storage areas for technology equipment in each classroom that would be secured

Basic equipment needed in the classroom of today:

1. Mounted video monitor in classroom with tie in for video playback
2. LCD for projection of computer images
3. Well designed projection for overhead projector. Secure area immediate to the classroom for this equipment
4. Wireless mikes

Faculty will not grow into more sophisticated uses of technology if they cannot access today's technology conveniently and easily.

The office of the faculty may be viewed as part of the classroom. In this high tech emphasis, the one on one w/ faculty to student interaction in the office is crucial to student success. Tech in the office includes computers, telephone, and needs to be close to classrooms and accessible to students.

TOPIC: Cross College Collaboration

Group Members:

Bertha Landrum
Jean Staten
Donna Murchland
Linda Rosenthal
Mary Gendron
Fred Gaudet
Joe LeCluyse
Lionel Martinez
Doyle Burke
Jamie Cavalier
Ed Kelty
Joyce Elsner
Bert McNeill
Julie Bertch
Katherine May
Ron Bleed

There are certain times when the hot competition between our institutions impede the achievement of the goals and missions of the colleges and the district. Collaborative efforts must begin at the highest levels of the organization (Presidents and Vice Chancellors) and infuse that process with technologies across the institutions.

- Top-down approach to commit to cooperation and collaboration in all efforts. Collaboration is an approach to problem-solving and the use of technology.
- Promote regional collaboration i.e., sophomore level courses scheduled on the west side among Glendale, Rio Salado, Phoenix, and Paradise Valley.
- Pilot programs be developed that foster collaboration among colleges i.e. "skunkworks programs" like the instruction via modem currently being explored by Rio Salado.
- State level discussion of faculty certification.
- Develop new employee orientation and reorientation for continuing employees that address the mission, goals and philosophy of the district
- Develop college-specific orientation and reorientation processes.
- Seed money included in each college budget to foster collaborative efforts.
- Refocus the JCEP priorities toward collaborative projects.
- Include a strong keynote speaker at faculty convocation with supporting materials (paper, audio tapes, etc.) available for distribution to attending faculty members.
- Recognize as a priority the use of technology in teaching and learning. A role model of commitment to collaboration in technology be developed.
- Encourage voluntary faculty and administrative exchange programs within the district and within the institutions.

37